

ABSTRACT

Disclosed is a hydrogen storage alloy material which is prepared by subjecting an amorphous alloy to a heat treatment in air or an oxygen atmosphere. The amorphous alloy has a composition, in atomic %, expressed by the following formula: $Zr_{100-a-b}Pd_aM_b$ (wherein $15 \leq a \leq 40$, $0 < b \leq 10$, and M is at least one metal selected from the group consisting of Pt, Au, Fe, Co and Ni). The Pd, the metal M and one or more compounds thereof are dispersed in a parent phase of ZrO_2 in the form of ultrafine particles. This alloy material exhibits a hydrogen storage amount of 2.5 weight % or more in a weight ratio relative to Pd contained in the material, and suited to a hydrogen storage/transportation medium. The alloy material can be produced by preparing a melt of a master alloy formed through a melting process, rapidly solidifying the melt at a cooling rate of 10^4 K/s or more to form the above amorphous alloy, and subjecting the amorphous alloy to an oxidizing heat treatment in air or an oxygen atmosphere at 250 to 350°C to selectively oxidizing the alloy element of Zr so as to allow the hydrogen storage metal of Pd or a Pd compound to be dispersed in a parent phase of ZrO_2 in the form of nanoparticle-size ultrafine particles.